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PROFILE OF ALBERTA DUCK HUNTERS: THE NORTH AMERICAN DUCK HUNTER SURVEY

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PROFILE OF ALBERTA DUCK HUNTERS: THE NORTH AMERICAN DUCK HUNTER SURVEY

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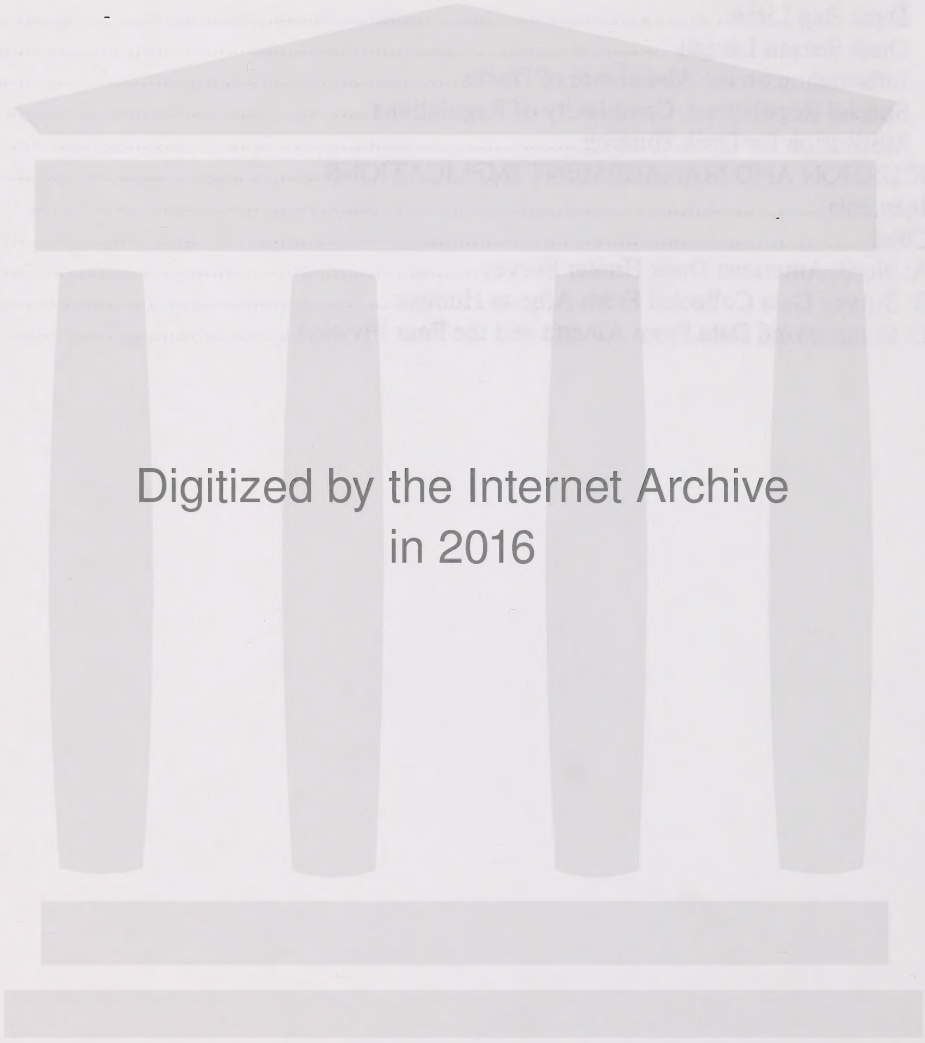

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I. INTRODUCTION

In the world of the North American duck hunter, the decade of the 1980s was characterized by a pronounced decrease in the abundance of ducks, especially the much sought after mallard. The surveyed North American mallard breeding population dropped from an average of 8.2 million during the 1970s to a low of 5.0 million in 1985 (Dubovsky et al. 1997), a decrease of 39%. Waterfowl managers throughout the continent focused on reversing the dramatic decline in duck numbers. Modification of harvest and hunting regulations was a natural target in the attempt to protect remaining stocks of ducks, while efforts continued on the habitat front to provide a landscape conducive to increased duck production. Hunters were faced with smaller bag limits and shorter season lengths. Annual harvest of mallards in the United States dropped from a high of 5.3 million in 1970 to a low of 2.0 million in 1988 (Sharp 1996). Alberta hunters reduced their harvest of mallards from a high of 714,100 in 1974 (Cooch et al. 1975) to a low of 80,300 in 1993 (Sharp 1996). In some jurisdictions, more noticeably in the United States than in Canada, special hunting zones within states, split seasons, and species and sex restrictions within the bag limit were employed. There were concerns that severe restrictions would force hunters from the field and attempts were made to maintain maximum duck hunting opportunity while diverting harvest effort away from species that were in need of protection. Hunting regulations became more complex as hunting opportunities were compressed into narrower time frames with lower bag limit rewards. Many hunters responded by discontinuing their duck hunting tradition. Hunter numbers declined dramatically in almost all North American jurisdictions. Hunting permit sales in the United States plummeted from a high of 2.4 million in 1970 to a low of 1.3 million in 1992 (Sharp 1996). In Alberta, the number of waterfowl hunters decreased from a high of 82,175 in 1977 (Newell et al. 1979) to a low of 25,746 by 1995 (Caswell and Schuster 1996).

While efforts were ongoing to reverse the decline of duck numbers, waterfowl managers have been very cognizant of and concerned about the decreasing numbers of hunters. Waterfowl hunters comprise the bulk of the support for waterfowl conservation efforts and this support was being eroded. Managers have been concerned about the impact that regulations, or various aspects of regulations have on the duck hunter's decision to continue or discontinue hunting.

There was increasing desire to more fully understand the effect of regulations on hunters. What regulations influenced hunters the most? What would hunters prefer in terms of bag limit versus season length? What was important enough to the duck hunter that he would continue to hunt in spite of reduced duck numbers, restricted bag limits or shortened seasons? What measures can be used to increase duck populations with the least impact on hunting opportunity or hunter participation? Many of these questions were asked, and just as many remained unanswered.

During 1995, the Central Flyway Waterfowl Technical Committee commenced plans for a flyway-wide survey of duck hunters in an attempt to gain insight into hunter participation patterns and the factors that hunters consider important in their decision to continue hunting. Interest in participating in the survey from states within the other three flyways, the Atlantic, the Mississippi and the Pacific, resulted in the evolution of the survey into a North American Duck Hunter Survey (NADHS). A total of 23 states agreed to canvas their hunters as part of this survey. Alberta, which is a member of both the Central and the Pacific Flyway, was the only Canadian jurisdiction to participate in the survey of duck hunters.

The results of the United States portion of the survey have been presented elsewhere (Ringelman 1997). This report summarizes the results of that portion of the NADHS conducted in Alberta and provides some comparison to similar data collected from duck hunters in the United States portion of the four flyways.

II. METHODS

The NADHS (Appendix A) was designed and coordinated by the Colorado Division of Wildlife (J. Ringelman) in cooperation with wildlife management agencies in other jurisdictions. Each province or state administered the delivery and collection of the questionnaire within its jurisdiction and forwarded collated data to the Colorado Division of Wildlife for analysis.

The objective of the NADHS was to obtain direct feedback from duck hunters with respect to their attitudes and opinions on various factors that affect hunter participation levels. Statistical reliability (±5%) required responses from at least 400 duck hunters from each jurisdiction (J. Ringelman pers. comm.). The objective was to provide questionnaires to a sufficient number of hunters (target 1200 hunters) to yield at least 400 usable responses from duck hunters.

Alberta conducts an annual Telephone Hunter Questionnaire that utilizes current year license sales data as a sampling base for surveys conducted in December and January following the hunting season. The waterfowl portion of the telephone questionnaire asks respondents if they were duck hunters. Positive respondents to this question on the 1995/96 waterfowl portion of the telephone questionnaire provided a sampling base for the portion of the NADHS conducted in Alberta. The telephone questionnaire database contained names and addresses of 1103 hunters who had indicated they were duck hunters. Thus, this sampling base provided an opportunity to directly sample the opinions and attitude of Alberta hunters who consider themselves to be duck hunters.

The NADHS was mailed to 1103 hunters during May 1996. Contingencies were in place to conduct a follow-up mailing in June if response to the initial mailing was inadequate. However, Alberta hunters returned 527 questionnaires (47.8% response rate), of which 509 (46.1%) were usable. The 509 usable questionnaires exceeded the requirement for 400 usable responses, negating the requirement for the second mail-out.

Data contained within the 527 responses were collated by Alberta and forwarded to Colorado Division of Wildlife for inclusion in analysis of data from all other jurisdictions. Colorado Division of Wildlife conducted all data analysis. The data for Alberta, along with comparable summarized data from each of the four flyways, were provided to Alberta.

III. RESULTS

The questionnaire design included six components, each intended to provide meaningful information on different aspects of duck hunter attitudes and opinions. Questions in part A provided information on the personal profile of a cross section of duck hunters. Part B attempted to garner information on the importance that hunters place of the size of the daily duck bag limit. Part C sought hunter opinion on the importance of the overall duck season length. Part D delved into the sources that hunters relied on for information relating to the annual abundance of ducks and how hunters would react to information they received on the status of duck populations. Part E dealt with hunter reaction to special regulations such as duck hunting zones and split seasons and to the complexity of regulations. Finally, part F attempted to define the 'satisfaction reward' that hunters considered important as their motivation for duck hunting.

A collation of data obtained from Alberta duck hunters is provided in Appendix B and summarized data for Alberta and for each of the Atlantic, Mississippi, Central and Pacific Flyways are provided in Appendix C. Within the following text, wherever the Alberta results are substantially different from those of United States duck hunters, the Alberta figures are compared to results from the four flyways. In these comparisons, (A) refers to Atlantic, (M) to Mississippi, (C) to Central, and (P) to Pacific Flyway jurisdictions that participated in the survey.

1. Hunter Personal Profile

The average Alberta duck hunter is a male (99%) born in 1951 (± 13.5 years, range 1918 - 1980) and confines all of his duck hunting effort to areas within the province. He has hunted ducks for a mean of 24.1 ±15.0 years (range 1 - 65 years) and, during the 1995/96 hunting season, he hunted waterfowl for a mean of 8.72 ±8.2 days (range 0 - 75 days). In comparison, United States duck hunters have hunted a fewer number of years (A 18.2, M 19.7, C 20.7, P 20.5) but hunted considerably more days during the season (A 11.2, M 15.6, C 10.8, P 11.6). Six percent of Alberta duck hunters did not hunt ducks in 1995/96 (A 7.9%, M 5.8%, C 13.4%, P 9.9%), 8% bagged no ducks during the season, 45% bagged more than 1 but less than 11 ducks, while 41% took more than 10 ducks. Only 17% of the duck hunters hunted with a youth (under age of 18) from their family, somewhat less than American duck hunters (A 23.1%, M 23.9%, C

27.2%, P 20.3%).

Over the past 4 seasons, 61.5% of Alberta duck hunters hunted ducks in each of the 4 years, 35.4% hunted during some but not each of the 4 years, 3.0% indicated that 1995/96 was their first year of duck hunting, and 0.2% stated that they planned to hunt ducks for the first time next season. When asked about hunting intentions for the next season, 2.4% of Alberta hunters stated they expected to not hunt ducks (A 1.2%, M 1.0%, C 2.5%, P 2.1%), 45.2% expected to hunt less than 7 times (A 27.6%, M 20.2%, C 35.4%, P 30.0%), and 52.5% indicated they would hunt more than 7 times (A 71.2%, M 78.8%, C 62.0%, P 67.9%).

2. Duck Bag Limit

Part B of the questionnaire relates to the subject of daily bag limits and attempts to determine the relative importance of the daily bag limit versus the length of the hunting season to the attitudes of hunters. Hunters were asked to indicate how they would react, in terms of relative number of days they would hunt under varying bag limits (from 1/day to 10/day), if the duck season length and number of ducks they saw were the same as the past year. Responses were numerically rated with the number 0 assigned to the response of 'no days' (wouldn't hunt), 1 to 'fewer days', 2 to 'same number of days', 3 to 'more days', and 4 to 'don't know'. Responses revealed proportions of hunters that would choose each option for each potential bag limit, plus allowed the calculation of arithmetic means which provided an indication of the relative reaction of all hunters to various potential bag limits.

Alberta duck hunter participation would be dramatically impacted by small bag limits. The majority of hunters indicated they would not hunt if the bag limit was 1 (mean 0.70 ±0.96) or 2 (mean 0.83 ±0.97) ducks per day. These low arithmetic means indicate that the majority of hunters would definitely hunt fewer days and would tend towards not hunting at all. A bag of 3 ducks per day would result in a fairly even split in hunters with 34.6% indicating they would not hunt, 28.3% hunting fewer days, and 37.2% hunting the same number of days. The mean of 1.07 ±0.92 indicates that, as a group, Alberta hunters would likely hunt fewer days with a slight tendency towards hunting the same number of days. A bag limit of 4 ducks per day would result in the majority of hunters hunting the same number of days (57.2%) but still with a large

contingent hunting fewer days (23.4%). Alberta hunters indicated that they find a bag limit of 5 or more ducks per day much more acceptable than any smaller bag with 78.5% likely to hunt the same number of days (mean 1.94±0.54). In comparison, duck hunters in the United States appear to more readily accept smaller bag limits. Arithmetic means that approach 2.00 indicate that the majority of hunters would likely hunt the same number of days. This level of acceptance by American hunters was approached with a bag limit of 3 (A 1.89, M 1.94, C 1.79, P 1.53) and was exceeded with a bag limit of 4 ducks per day (A 2.10, M 2.15, C 2.08, P 1.94).

A bag limit of 6, 7, 8, 9, or 10 ducks per day would all result in the large majority of Alberta hunters (78.5%, 79.9%, 74.8%, 68.7%, 61.7%, 60.2%, respectively) hunting the same number of days. The arithmetic means for these bag limits (1.94±0.54, 1.98±0.51, 1.97±0.54, 1.97±0.61, 1.97±0.67, 1.97±0.68) indicate a strong preference for maintaining the same hunting effort with no strong tendency towards hunting more days, regardless of how large the bag limit. Interestingly though, under a bag limit of 8, 9 or 10 ducks per day, Alberta hunters who indicated some choice other than the same number of hunting days, were evenly split between hunting fewer days and hunting more days. Under a bag of 8 ducks per day 13.9% would hunt fewer days with 15.3% hunting more. A bag of 9 ducks per day would result in 17.3% of hunters hunting fewer days and 18.7% hunting more. A bag of 10 ducks per day would result in 18.0% of the hunters hunting fewer days and 19.4% hunting more days. For comparison, within United States jurisdictions, bag limits of 5 or more ducks per day produced arithmetic means that were consistently and considerably greater than 2.00 indicating that hunters in these areas would demonstrate a strong tendency towards hunting more days per season under more liberal bag limits.

Alberta duck hunters showed little clear preference for either a bag limit increase of 1 bird per day or a season length increase by 10 days if the objective was to provide increased hunting opportunity. Forty-one percent preferred the increased bag limit with the same season length and 40.4% preferred increased season length with the same bag limit. Conversely, within the United States portion of the flyways the preference was obviously in favour of increased season length over that of bag limits (A 75.8/19.1, M 73.8/20.4, C 65.0/24.1, P 73.3/18.8).

Alberta hunters indicated they would be relatively content with current bag limits and season length if the objective was to maintain the same hunting opportunity. The majority of

hunters (59.2%) favoured the same bag limit and season length, with an increased season length being the second preference (24.4%). Within the United States the preference was closely split between the same bag limit and season length versus and an increased season length and a smaller bag limit. An increased bag limit with a shorter season length was the least preferred option (A 42.0/ 46.5/11.6, M 43.4/46.3/10.3, C 46.1/40.2/13.8, P 43.2/46.3/10.5).

Hunters were also asked to indicate their preference, decreased bag limit with the same season length or a decreased season length with the same bag limit, if hunting opportunity had to be decreased. Alberta hunters showed a greater preference for the decreased bag limit (57.0%) over a decreased season length (34.1%). This response agrees with the response from United States hunters although the indicated preference for decreased bag limit size was much stronger in the United States (A 70.6, M 71.6, C 62.1, P 69.1).

Few Alberta hunters indicated they had not hunted during an entire season because the bag limit was considered too small (9.4%), compared to somewhat higher non-participation rates in the United States (A 12.9%, M 12.8%, C 16.2%, P 10.5%). The majority of Alberta hunters (62.2%) agree that, with high populations, there should be a maximum bag limit size rather than setting the bag limit as high as possible without harming populations (37.8%). However, hunters in Alberta differed from their American counterparts with respect to the size of the maximum bag that should be allowed. Albertans preferred a mean bag limit of 7.67±2.76 (range 2 - 25) ducks per day as a maximum while that from United States hunters was considerably lower (A 5.27, M 5.16, C 5.51, P 6.33).

3. Duck Season Length

Part C of the questionnaire was designed to garner information on the relative importance of various season lengths to hunters and derive some indication of what hunters considered an acceptable season length. Hunters were asked to indicate their reaction (Not hunting, Fewer days, Same number of days, More days, or Don't know) to season lengths which varied, by two-week intervals, from a season that was 1 week long to one that was 15 weeks long, if the bag limit and the number of ducks they saw were the same as the last hunting season.

Alberta hunters reacted negatively to any season length that was less than 9 weeks long

with the vast majority indicating they would hunt the same number of days, fewer days or not hunt at all with shorter seasons. A season of 7 weeks appears to be the minimum length that would encourage the majority of hunters to hunt at least the same number of days. The mean for Alberta hunters was well below 2.00 for season lengths of 1 to 5 weeks, reached 1.84±0.69 for a season length of 7 weeks, climbed to 1.98±0.54 for a 9-week season, and exceeded 2.00, indicating they would hunt the same or more days, only for seasons that were 11 weeks or longer (2.10 for 11 weeks, 2.15 for 13 weeks, 2.18 for 15 weeks). Within the United States, hunter acceptance (indicated by a mean >2.00), with the exception of the Pacific Flyway, generally occurred with a season length of 5 weeks (A 2.09, M 2.04, C 1.91, P 1.61). Season lengths greater than 5 weeks produced a reaction that indicated hunters would hunt the same or more number of days. Pacific Flyway hunters appear to resemble Alberta hunters in their preference for a season length of 7 weeks or longer.

Hunters in Alberta have seldom not hunted for an entire season as a result of the season length being too short (4.1%). This response was somewhat more significant within United States jurisdictions (A 14.1%, M 11.6%, C 11.7%, P 9.9%) where hunting season lengths have a recent history of being considerably shorter than those in Canada.

4. Information on the Abundance of Ducks

Publicity about or knowledge of the status of duck populations can impact a hunter's attitude about pursuit of hunting activities. Hunters were asked to indicate their source of information about duck abundance that most affected their decision to hunt. Alberta hunters indicated that the number of ducks seen before and during the season was most important (39.1%), followed by an indication that reports of duck abundance generally does not affect their decision to hunt (22.7%). Beyond that, information provided by wildlife agencies was considered (16.0%), followed closely by information on the status of ducks from Ducks Unlimited or other sporting groups (13.8%). Very few hunters relied on information from magazine and newspaper articles (2.8%).

In an effort to determine the impact that information on the status of duck populations has on hunter attitudes towards hunting, hunters were asked to indicate how they would react in

terms of hunting activity, to various population status reports if the bag limit and season length were the same as last year. Options for responses were no days, fewer days, the same number of days, more days, and don't know.

The majority of Alberta hunters indicated they would react to information that duck populations were only half the number that they were last season by hunting fewer days (46.1%), with a strong proportion that would hunt the same number of days (30.7%) or not hunt at all (21.9%). The mean of 1.11±0.75 indicates a probability of hunting fewer days with some trend towards hunting the same number of days. Responses from United States jurisdictions were somewhat similar although there was a stronger leaning towards hunting the same number of days (A 1.49, M 1.58, C 1.43, P 1.42).

If the information source indicated that there were somewhat fewer ducks than last season, most Alberta hunters would hunt the same number of days (55.4%) with fewer hunting less days (38.3%). The mean of 1.52±0.61 indicated a greater tendency to hunt the same number of days although some hunters would hunt fewer days. United States hunters again showed more of a tendency to hunt the same number of days (A 1.78), M 1.87, C 1.77, P 1.78).

If the duck population was believed to be the same as that of last season, 90.0% of Alberta hunters indicated they would hunt the same number of days (mean 2.01±0.38). United States hunter reaction was similar although with somewhat more of a tendency towards hunting more days (A 2.08, M 2.14, C 2.12, P 2.11).

Most Alberta hunters would still hunt the same number of days (73.8%) if reports indicated the population was somewhat better than last season although about one-quarter of the hunters (24.0%) indicated they would hunt more days (mean 2.21±0.49). In United States jurisdictions hunters showed a stronger tendency towards increased hunting activity (A 2.37, M 2.41, C 2.39, P 2.37).

Information sources that indicated the duck population was twice as abundant as that of the last season produced almost an even split in Alberta hunters between those that would hunt more days (50.1%) and those that would hunt the same number of days (48.4%). The mean (2.48±0.54) indicates a stronger trend towards hunting more days but, once again, not as strong as that intent with United States hunters (A 2.64, M 2.63, C 2.66, P 2.67).

5. Special Regulations, Complexity of Regulations

Compared to jurisdictions in the United States, Alberta hunters have had little experience with special regulations such as zones, species and sex restrictions, or split seasons. However, for a short period in the mid-1980s there was a restriction on the number of mallards within the daily bag limit, there remains a restriction on the number of pintails, and the province is divided into 8 different zones which can have slightly different season dates although the difference is normally only a one-week variation in season opening dates. Albertans have, however, had little exposure to split seasons. Part E of the questionnaire asked the hunter several questions related to special regulations in an attempt to garner information on hunter perceptions and attitudes towards these regulations.

The majority of Alberta hunters (78.6%) did not feel that bag restrictions for certain species or sexes of ducks within the daily bag affects their decision to hunt (A 87.4%, M 92.4%, C 86.2%, P 86.7%). Similarly, 64.0% of these hunters indicated that species or sex restrictions neither increased nor decreased their hunting satisfaction, 22.1% said they decreased satisfaction and 13.8% believed they increased satisfaction. When presented with the option of having a smaller overall bag limit to have fewer species and sex restrictions in the bag, 43.3% of Alberta hunters were in favour of the smaller bag compared to 37.4% not in favour. Within United States jurisdictions, the proportions were almost reversed with less hunters favouring the smaller bag for fewer restrictions within the bag (A 32.0/45.5, M 26.8/46.9, C 30.0/43.6, P 30.0/49.3).

Most Alberta hunters (70.8%) did not feel that duck hunting zones that have different opening or closing season dates make regulations more difficult to understand. Hunters within the United States share a similar attitude although the ratio of those who do not feel, to those who do feel that zones make regulations more difficult to understand, is smaller (A 54.6/35.5, M 62.6/31.8, C 55.6/39.9, P 53.5/41.8). The impact of zones on hunting satisfaction appears to be insignificant in Alberta with 85.2% of hunters indicating they had no effect. American hunters share the same general perceptions with respect to zones although the proportion of hunters who feel zones have no effect is somewhat lower (A 73.0%, M 74.5%, C 69.9%, P 68.8%).

Although split seasons are not a management tool that is used in Alberta duck seasons they have been used with some goose seasons in previous years. In spite of no experience with split seasons for ducks, Alberta hunters did respond to the question with 48.1% indicating that

split seasons do not make hunting regulations more difficult to understand, while 28.4% indicated they did. Most Alberta hunters did not feel that splits affect their hunting satisfaction (66.5%), 31.2% felt that they decreased their satisfaction, and 2.3% indicated they increased their satisfaction.

Hunters in Alberta indicated that a weekend start of the duck season is not important (78.7%) (A 59.1%, M 54.7%, C 55.8%, P 62.8%). Further, the majority (73.0%) indicated that opening the season on a weekend has no effect on their hunting satisfaction. Only 17.5% felt that a weekend opening increased their satisfaction while 9.5% stated that their satisfaction was decreased by a weekend opening. Comparatively, within the United States, hunters appeared to be somewhat more divided on this issue with fewer hunters indicating weekend opening had no effect, more indicating it increased their satisfaction, and slightly more stating that a weekend opening decreased their satisfaction.

Annual changes to duck hunting regulations do not appear to make a difference to the majority of hunters in Alberta (62.0%) although a significant proportion (38.0%) indicated that they do. Changes from year to year would appear to have no impact on the satisfaction of 65.9% of the hunters while 27.5% stated that these changes decrease their hunting satisfaction. Only 6.6% felt that these changes increased their hunting satisfaction. Within United States jurisdictions, a higher proportion of hunters felt that annual regulation changes made a difference to them (A 46.1%, M 42.4%, C 43.0%, P 45.7%) but, the majority of hunters felt that annual changes had no effect on their hunting satisfaction. However, a significant proportion felt that year to year changes decreased their hunting satisfaction (A 35.1%, M 28.4%, C 31.9%, P 34.3%).

When asked if simplifying hunting regulations would affect their decision to hunt ducks, the majority of hunters in both Alberta and the United States indicated it would not (Alberta 77.4%). Although most hunters felt that simplification of regulations would have no effect on their hunting satisfaction (Alberta 61.5%), a significant number felt that regulation simplification would increase their hunting satisfaction (Alberta 37.5%, A 47.7%, M 42.8%, C 48.3%, P 46.2%). Only 1.0% of Alberta duck hunters indicated that they have not hunted ducks for an entire season because regulations were too hard to understand (A 3.9%, M 2.6%, C 5.0%, P 3.9%).

Hunters were asked to pick one of several factors which most affects their decision to hunt ducks each season. In Alberta, hunters indicated the primary consideration is the abundance of ducks (48.7%), followed by season length (10.9%), bag size (7.3%) and special regulations (0.8%). A large segment of respondents (32.3%) felt that the questionnaire did not identify any of the factors that affect their decision to hunt. Within the United States, hunters exhibited a similar ranking with abundance of ducks being most important, followed by season length, bag size and special regulations. A slightly larger proportion of United States hunters indicated that the questionnaire did not identify the primary factor that affected their decision to hunt (A 37.1%, M 40.8%, C 34.4%, P 35.9%).

6. Motivation for Duck Hunting

Duck hunters expend considerable time and effort in the pursuit of this chosen recreational activity. As a 'reward' for this time and effort there is some sense of accomplishment that is satisfying to the hunter. The measure of this satisfaction though, varies for the individual hunter depending on the reasons for which the individual goes hunting. Part F of the questionnaire represents an attempt to gain some insight into the types of satisfaction that hunters gain from their hunting experience and how important the various types of satisfaction are. Hunters were asked to indicate (scale of 0 to 4) how important each of three types of satisfaction was to them as a motivation to hunt ducks. The three types of satisfaction can roughly be classed as a factor of (1) achievement, (2) affiliation, and (3) appreciation.

The achievement factor refers to the accomplishment of some objective related to the physical bagging of ducks. It could be filling of the bag limit, being successful in the challenge of shooting the bird, pride in the birds harvested or the equipment used, or striving to improve oneself or being thought of as a good hunter. The affiliation factor is less focused on the goal of bagging ducks and can be described as a satisfaction from sharing in the experience of hunting with others. It includes such rewards as sharing hunting stories, continuing with the tradition of hunting or going into the field with friends or associates. The appreciation factor focuses more on the mental or emotional satisfaction of the individual as opposed to either bagging ducks or sharing the experience with others. Duck hunting can mean an escape from the routine or stress

of daily life, appreciation of the solitude or characteristics of nature, or simply an opportunity to observe and appreciate exposure to waterfowl.

Alberta respondents indicated that the achievement factor was relatively low in their satisfaction gained from duck hunting (mean 1.66 ± 1.26) and is considered to be low motivation for hunting ducks. Considerably more importance was placed on affiliative factors (mean 3.09 ± 1.05). However, Alberta hunters ranked the appreciation factor as the most important of the three (mean 3.68 ± 0.63), indicating a high degree of identification with appreciative factors as a motivation for duck hunting. Responses from Alberta hunters with respect to factors that motivate them to hunt compare very closely with those of their American counterparts; appreciation being most important, affiliation of secondary importance, and achievement lowest on the scale.

IV. DISCUSSION AND MANAGEMENT IMPLICATIONS

The questionnaire designed for use in the NADHS delved into the thoughts, perceptions, attitudes and preferences of duck hunters with respect to many aspects of duck hunting, hunting regulations, population status information and techniques used by managers to maintain hunting opportunity. The responses received from hunters are quite revealing and will be useful in terms of guidance for waterfowl managers. At the same time, some of the responses and inherent messages they provide should be of some concern to managers. In many respects, the attitudes and indicated preferences of duck hunters in Alberta are, comparatively, very similar to those of their United States counterparts, even though Alberta hunters have been exposed to significantly different hunting regimes. There are some subtle differences though, that may be reflective of the tradition that groups of hunters have experienced.

Duck hunters in Alberta are not young and there appears to be a very low level of recruitment of youths into sport hunting of ducks. Previous investigation into the characteristics of hunters in Alberta (Boxall and Smith 1986) found that the age structure of the hunting segment of society was advancing at a more rapid pace than that of the general population of the province. Although their investigations encompassed all hunters as opposed to only duck or waterfowl hunters, making it difficult to directly compare data, they showed that for the period of 1974 to 1984, seventy-five percent of all hunters were under the age of 45 years and 70% were under 35 years of age. The results from this survey indicate that the average age of all duck hunters is 45 years, indicating that, as of 1996, only 50% of Alberta's duck hunters are under the age of 45. Boxall and Smith also found declining levels of young hunters. In 1974, 12% of the hunters in Alberta were in the age group of 15 to 19 years. The proportion for this age group had declined to 7% by 1984. Data from the NADHS revealed that only 1.6% of the respondents to this questionnaire were under the age of 19 years (born 1977 or later). The data collected and provided by Boxall and Smith also indicate that the proportion of game bird hunters (upland plus waterfowl) that were in the age group of 15 to 24 years, decreased from 31% in 1980 to 23% in 1984. Data from this survey shows that only 5% of the duck hunters in Alberta were in that same age group in 1996 (born 1972 or later).

The NADHS indicated that only 17% of Alberta duck hunters hunted with a family

member who was under the age of 18 years. Conversely, more than 20% (20% - 27%) of the hunters in the United States portion of the four flyways hunted with young family members. Older family members introducing youths to sport hunting is believed to be a principal source of recruitment of new hunters. This low level of practical recruitment combined with evidence of the increasing age structure of hunters and declining proportions of hunters in younger age groups should be of significant concern to waterfowl (and wildlife) managers.

Boxall and Smith (1986) found that, from 1974 to 1984, there was a small but increasing proportion of females in the ranks of Alberta hunters (3.1% in 1974 to 5.8% in 1984). Data they provided show that, for one reason or another, there appeared to be less female game bird hunters than there were for other species of game. Female game bird hunters actually decreased from 2.9% in 1980 to 2.1% in 1984. The NADHS revealed that only 1% of the duck hunters in Alberta are females, indicating that either the female proportion of waterfowl hunters has decreased or female game bird hunters hunt species other than ducks. It is also evident that more females pursue game species other than birds than those that hunt birds (Boxall and Smith 1986). Managers should be cognizant of the low percentage of the hunting community that is comprised of females and efforts should be made to introduce females to recreational hunting of ducks.

As a group, Alberta hunters spend fewer days hunting ducks (8.72) than their American counterparts (10.8 to 15.6) but the total seasonal bag taken is very similar. The hunting effort between jurisdictions is also an interesting comparison in terms of anticipated effort for the next season. A large contingent of Alberta hunters (45%) anticipated that they would likely hunt less than 7 days compared to only 20% to 35% of American hunters who offered the same response. This perhaps, is reflective of the larger bag limits in Alberta as opposed to United States jurisdictions.

Duck hunting in Alberta would appear to be impacted by any bag limit that is less than 5 birds per day with a high proportion of duck hunters that would hunt less or discontinue hunting if limits were below that level. Duck hunters in Alberta appear to consider a bag limit of 5 birds per day as the minimum level acceptable before decreasing hunting effort. Comparatively, United States hunters appear to accept lower bag limits more readily and would accept a bag limit of 3 birds per day. Hunter reaction to potential bag limit size may be a reflection of past experience. In Alberta, bag limits have been as low as 5 birds per day but never lower, whereas,

United States hunters are accustomed to bag limits as low as 3 birds per day. From that perspective, it should not be surprising that the expectations of Alberta hunters, with respect to bag limits, are higher than that of United States counterparts.

Potential bag limits that were greater than 3 birds per day produced reactions amongst United States hunters indicating they would increase hunting effort by hunting more days. Although Alberta hunters appear to want a bag limit of at least 5, they indicate that they would not increase the number of days hunted at any of the higher bag limits, up to 10 birds per day. At larger bag limits (8, 9 or 10/day) they appear to be content to hunt the same number of days. Even amongst those who indicated they would change their hunting effort with the higher limits, the anticipated change was closely split between those who would hunt more days and those who would hunt fewer days. This tends to demonstrate that there may be two segments to the duck hunter population. The amount of hunter effort in one segment may be determined by the total number of ducks retrieved. These hunters may only want to retrieve a specified number of ducks and anticipate that with larger bag limits it will take fewer days to achieve that objective. The other segment appears to be motivated by something independent of number of ducks that can be retrieved and tend to seize the recreational opportunity provided by more liberal bag limits.

Duck hunters in Alberta showed no clear preference for increased bag limits or longer season length when the objective was to increase hunting opportunity. However, if the objective was to maintain the same hunting opportunity or decrease hunting opportunity, hunters indicated a preference for a smaller bag limit rather than shortening the length of the season. In this respect Alberta hunters share with their American counterparts the perception that a lengthy hunting season is of more importance than a large bag limit. This factor is of significance considering that season lengths in Alberta are normally long and, for the most part, approach the maximum allowed under the Migratory Birds Convention. In spite of that fact, Alberta hunters still appear to prefer a smaller bag limit as opposed to any shortening of the season length.

Hunters in all jurisdictions, both in Alberta and the United States, indicate that there should be a maximum size to the duck bag limit as opposed to setting the limit as high as possible without harming the population, although Alberta hunters appear to feel stronger in this respect than hunters in the United States. Variation also exists in what hunters consider to be an adequate maximum bag limit size. Alberta hunters, on average, indicate that a bag limit of 8

birds per day should be the maximum as opposed to 5 or 6 birds per day in the United States. Again, this may be a reflection of the hunters' past experience. Alberta hunters are more accustomed to a larger bag limit and consequently, are not as content with the smaller bag limits that American hunters have experienced.

Differences in hunter opinions also appear in terms of what hunters accept as a reasonable season length. Alberta hunters want a season length of at least 9 weeks while United States hunters, with the exception of those in the Pacific Flyway, more readily accept a season of 5 weeks duration. A greater proportion of United States than Alberta hunters have not hunted for an entire season because they felt the season was too short. These differences may also be a reflection of the traditional length of seasons in various jurisdictions. Alberta hunters are accustomed to long duck seasons (>80 days) while United States jurisdictions have had seasons as short as 39 days.

Hunters in both Alberta and the United States appear to rely on the number of ducks they see before or during the season as their primary source of information on duck abundance more so than any other potential information source. There is a strong indication that reports on duck abundance, other than personal observations, do not affect the hunter's decision to hunt. Hunters do not appear to consider information provided by wildlife management agencies or non-government sporting groups as a primary source of information on duck population status. Either communications by these groups is inadequate, possibly because hunters are more concerned with local conditions, or these groups suffer credibility within the hunting community.

Responses dealing with the issue of special regulations, sex and species regulations, zones, and split seasons were inconclusive. Hunters in Alberta and the United States did not appear to consider sex/species restrictions, zones, or split seasons as major factors making regulations more difficult to understand. Special regulations such as these do not appear to have a significant impact on the satisfaction of hunting. However, there was a stronger indication within United States jurisdictions than there was in Alberta that a smaller bag limit would be favoured if it meant fewer sex/species restrictions in the daily bag. Once again, this stronger opinion amongst United States hunters may be a reflection of the complexity of regulations and prevalence of species and sex restrictions that they have had to contend with over the past several years.

Hunters in Alberta indicate that a weekend opening for the season makes no difference to hunting satisfaction and the majority of hunters in all jurisdictions felt that annual changes to regulations had no impact. However, a significant proportion of United States hunters favoured a weekend opening as a factor that increases hunting satisfaction. Similarly, a considerable number of United States hunters indicated that annual regulation changes decreased their satisfaction with hunting. In spite of regulations that sometimes appear to be complex, the majority of hunters in all jurisdictions indicated that the complexity of regulations was not a significant factor in their decision to hunt and most hunters suggested that simplification of regulations would not affect their satisfaction with hunting. However, there were a significant number of United States hunters (38%-48%) who felt that simplification of regulations would increase their hunting satisfaction. It appears that hunters in Alberta are more tolerant to variation in season opening dates, annual regulation changes and complexity of regulations, perhaps because regulations in Alberta are relatively simple compared to those in some United States jurisdictions.

Although there does not appear to be any strong negative feelings about split seasons, zones, or sex/species regulations, the combination of these, along with annual changes to regulations, appears to have had a greater effect on American hunters than it has on those in Alberta. Very few Alberta duck hunters have not hunted because of the complexity of regulations but up to 5% of United States hunters indicated they did not hunt for an entire season because regulations were too complicated.

The bulk of the duck hunters in Alberta and all four flyways agree that, of the items identified in the questionnaire, the abundance of ducks and the season length are the two most important factors that affect their decision to hunt. The size of the bag limit and the number of special regulations are of lesser importance. However, in all jurisdictions, high proportions of the hunters (32% - 41%) indicate that none of the items identified is the factor that most affects their decision to hunt. Although the responses to this question provides useful and relevant feedback with respect to the items or issues identified, it is obvious that there are other factors that are just as important, or perhaps more important to hunters with respect to their decision to hunt. Thus, although the information gained is beneficial it does not definitively identify some critical factors that have substantial impact on hunter participation, or even indicate if those

factors are in the realm of influence by waterfowl managers. Managers should utilize the information gained accordingly but they should remain cognizant that there are issues and factors that influence hunter participation that may not be addressed through regulations and season setting processes, or that have not been identified.

The information gained from the NADHS is valuable to resource managers and every effort should be made to utilize this knowledge in management of hunting and hunters. Season setting and drafting of regulations should be as unobtrusive as possible and should capitalize on using techniques that appear to offer the least impediment to the decision to continue hunting. However, the survey does not provide all the answers and additional work is required to refine the identification of factors that determine or influence hunter participation. Following identification of these factors, action needs to be undertaken to address those issues if hunter numbers are to be increased or maintained. Identifying and addressing those issues may retain existing hunters and, with some effort, may regain some hunters who have discontinued the sport. In the interim, jurisdictions should make every effort possible to recruit new and especially the young hunter into the recreational sport of waterfowl hunting.

Acknowledgements

This survey of duck hunters in Alberta was conducted as a part of a much larger survey of duck hunters within the four flyways of North America. Dr. Jim Ringelman, formerly of the Colorado Division of Wildlife, provided the driving force to initiate the project, and, along with assistance from state waterfowl managers and experts in human dimensions research, assumed the responsibility for development of the questionnaire. Dr. Ringelman also coordinated the continent-wide survey effort and conducted the analysis of data provided from each jurisdiction. For the Alberta portion of the survey, he conducted the data analysis and provided the results that have been incorporated into this document. Sincere thanks are extended to Dr. Ringelman for his enthusiastic efforts with respect to the survey. Appreciation is also extended to Sylvia Birkholz who conducted the Alberta survey and collated results from respondents prior to data analysis. Lastly, the duck hunters who took time to complete and return the survey are appreciated. Your willingness to cooperate in the survey shows your dedication and concern about the future of waterfowl hunting as a recreational pursuit.

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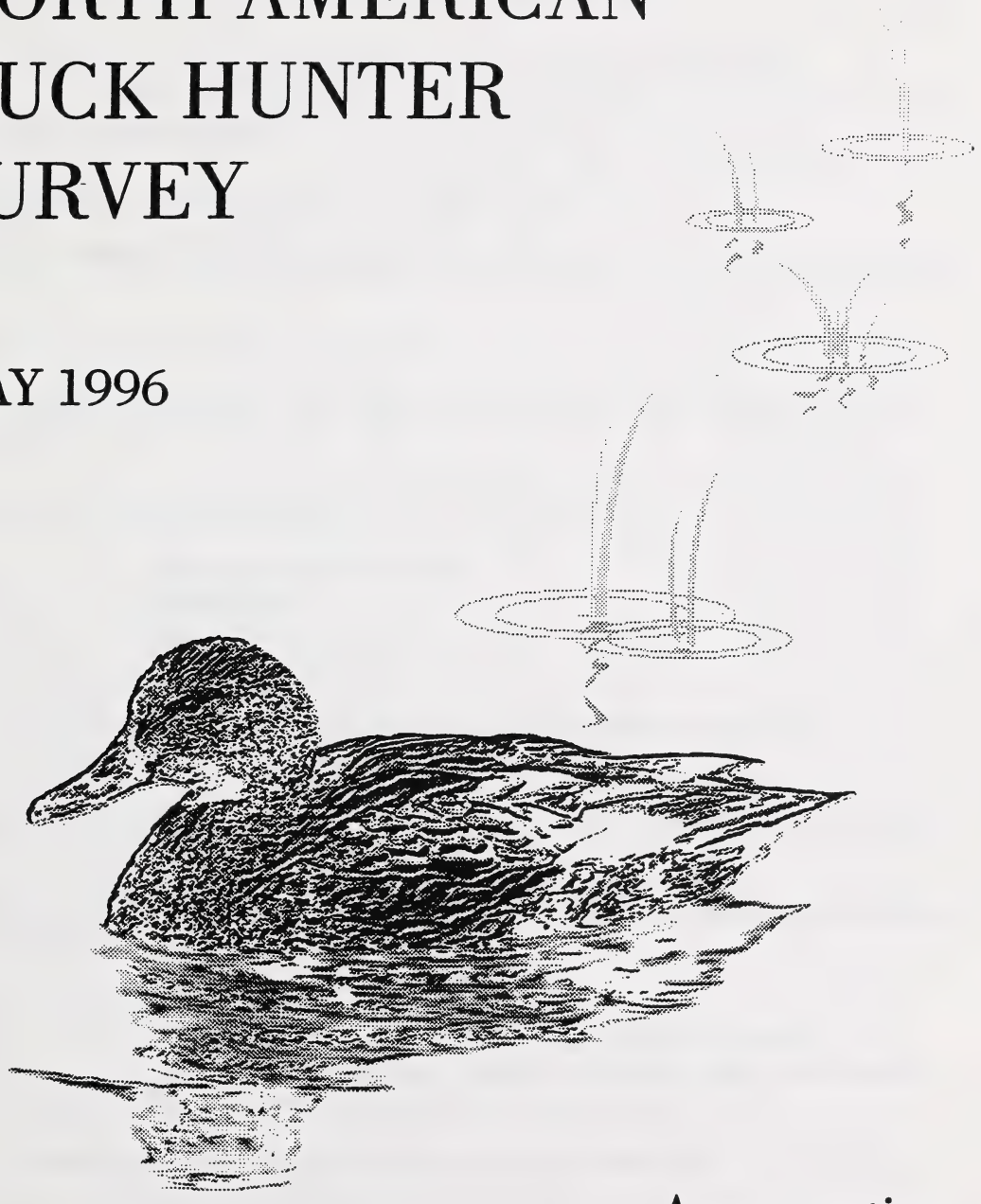
Appendix A: North American Duck Hunter Survey

Nº 1151

NORTH AMERICAN DUCK HUNTER SURVEY

MAY 1996



A cooperative
survey sponsored by state
and provincial wildlife agencies

North American Duck Hunter Survey

Part A. We would like to know more about you and your duck hunting experience.

1. What year were you born? _____

2. Are you: a. male _____ b. female _____

3. Which state /province do you hunt ducks in most often? _____

4. How many years have you hunted ducks? _____

5. During the 1995-96 season, how many days did you hunt waterfowl (ducks, geese, and swans)? _____

6. How many ducks did you bag last season, 1995-96 (check one)?

   a. ____ Did not hunt ducks last season.
   b. ____ Bagged none.
   c. ____ Bagged 1-10.
   d. ____ Bagged more than 10.

7. In 1995-96, did you hunt with a family member who was under 18 years old?
   a. ____ Yes b. ____ No

8. If you answered yes to question 7, how many youth hunters in your family did not require hunting licenses because of their age? _____

9. Which one of the following statements best describes your participation in **duck hunting** during the **last 4 years** (check one)?

   a. ____ I hunted ducks during each of the last 4 seasons.
   b. ____ I hunted ducks during some, but not each, of the last 4 seasons.
   c. ____ I am new to the sport of duck hunting, and last year was my first season.
   d. ____ I plan to hunt ducks for the first time next season.

10. How many days do you expect to hunt ducks **next year** (check one)?

    a. ____ None.
    b. ____ Less than 7 times.
    c. ____ 7 or more times.

Part B. The following questions relate to **BAG SIZE**, or the number of ducks you can shoot in one day.

In questions 1-10 below, we would like to know how you would react if the duck season length and the number of ducks you saw were the same as last year, and the **bag limit** was as indicated below (circle the appropriate number for each bag limit).

		Compared to last year, I would hunt:				
	If the bag limit was:	No days (wouldn't hunt)	Fewer days	The same # of days	More days	Don't know
1.	1 duck per day	0	1	2	3	4
2.	2 ducks per day	0	1	2	3	4
3.	3 ducks per day	0	1	2	3	4
4.	4 ducks per day	0	1	2	3	4
5.	5 ducks per day	0	1	2	3	4
6.	6 ducks per day	0	1	2	3	4
7.	7 ducks per day	0	1	2	3	4
8.	8 ducks per day	0	1	2	3	4
9.	9 ducks per day	0	1	2	3	4
10.	10 ducks per day	0	1	2	3	4

11. If duck hunting opportunity could be **increased** over what was offered last year, would you prefer to have (check one):

a.____ **Bag size increased** by one duck and the **season length stay the same** as last year.
b.____ **Season length increased** by 10 days and **bag size stay the same** as last year.
c.____ Don't care or no opinion.

12. If duck hunting opportunity could be **the same** as last year, would you prefer to have (check one):

a.____ **Bag size increased** by one duck and the **season length reduced** by 10 days.
b.____ **Season length increased** by 10 days and **bag size reduced** by one bird.
c.____ Same season length and bag size as last year (no change).

13. If duck hunting opportunity had to be **decreased** from what was offered last year, would you prefer to have (check one):

a.____ **Bag size decreased** by one duck and the season length stay the same as last year.
b.____ **Season length decreased** by 10 days and bag size stay the same as last year.
c.____ Don't care or no opinion.

14. Have you ever **not** hunted during an entire season because the bag size was too small?
a. ____ Yes b. ____ No c. ____ Don't remember

15. When duck populations are high, which one of the following statements best reflects your opinion about how duck bag limits should be set (check one)?

a. ____ I believe that the bag limit should be set as large as possible, as long as duck populations will not be harmed.

b. ____ I believe that the maximum bag should not exceed a certain size.

16. If you checked 15b above, please indicate what you think the maximum duck bag limit should be: _____ ducks (leave blank if you checked 15a).

Part C. The following questions relate to **SEASON LENGTH**, the number of days you can hunt ducks.

In questions 1-8 below, we would like to know how you would react if the duck bag limit and the number of ducks you saw were the same as last year, and the **season length** was as indicated below (circle the appropriate number for each season length).

		Compared to last year, I would hunt:				
	If the season was:	No days (wouldn't hunt)	Fewer days	The same # of days	More days	Don't know
1.	1 week long	0	1	2	3	4
2.	3 weeks long	0	1	2	3	4
3.	5 weeks long	0	1	2	3	4
4.	7 weeks long	0	1	2	3	4
5.	9 weeks long	0	1	2	3	4
6.	11 weeks long	0	1	2	3	4
7.	13 weeks long	0	1	2	3	4
8.	15 weeks long	0	1	2	3	4

9. Have you ever **not** hunted ducks for an entire season because the season was too short?
a. ____ Yes b. ____ No c. ____ Don't remember

Part D. The following questions relate to the **ABUNDANCE OF DUCKS** and your interest in hunting.

1. Which of the following sources of information about duck abundance **most** affects your decision to hunt ducks (check one)?

a. ____ The duck populations reported by state /provincial and federal wildlife agencies.
b. ____ The duck populations reported by Ducks Unlimited and other sporting groups.
c. ____ Magazine and newspaper articles about anticipated duck populations.
d. ____ The number of ducks my friends and I see before and during the season.
e. ____ Reports of duck abundance generally don't affect my decision to hunt.
f. ____ None of the above.

In questions 2-6 below, we would like to know how you would react if the duck bag limit and the season length were the same as last year, and the number of ducks reported by your best information source was as follows (circle the appropriate number for each prediction).

	If the reported number of ducks was:	Compared to last year, I would hunt: No days (wouldn't hunt)	Fewer days	The same # of days	More days	Don't know
2.	Only half the number of ducks as last season.	0	1	2	3	4
3.	Somewhat fewer ducks than last season.	0	1	2	3	4
4.	The same number of ducks as last season.	0	1	2	3	4
5.	Somewhat more ducks than last season.	0	1	2	3	4
6.	Twice the number of ducks as last season.	0	1	2	3	4

7. Have you ever **not** hunted ducks for an entire season because the reported population of ducks was too low?
   a. ____ Yes b. ____ No c. ____ Don't remember

Part E. The following questions relate to **SPECIAL REGULATIONS,** which describe what species and sexes of ducks you can keep, and when, where, and how you can hunt ducks.

1. Do bag restrictions for certain species or sexes of ducks (for example, no more than 1 hen mallard in the bag) **affect your decision to hunt** ducks?
   a. ____ Yes b. ____ No

2. How do bag restrictions for certain species or sexes of ducks affect your duck hunting **satisfaction**?
   a. ____ Increases satisfaction b. ____ No effect c. _____ Decreases satisfaction

3. Would you be willing to accept an overall smaller bag limit to have fewer species and sex bag limit restrictions?
   a. ____ Yes b.____ No c. ____ No opinion / don't know

4. Do duck hunting zones (areas that have different opening or closing season dates) make hunting regulations hard to understand?
   a. ____ Yes b. ____ No c. ____ Not applicable

5. How do duck hunting zones affect your duck hunting **satisfaction**?
a. ____ Increases satisfaction b. ____ No effect c. ____ Decreases satisfaction

6. Do season splits (open and closed periods for duck hunting) make the duck hunting regulations hard to understand?
a. ____ Yes b. ____ No c. ____ Not applicable

7. How do duck hunting season splits affect your duck hunting **satisfaction**?
a. ____ Increases satisfaction b. ____ No effect c. ____ Decreases satisfaction

8. Does it make a difference to you whether the start of the duck hunting season occurs on a weekend?
a.____ Yes b. ____ No

9. How does opening the duck season on a weekend affect your duck hunting **satisfaction**?
a. ____ Increases satisfaction b. ____ No effect c. ____ Decreases satisfaction

10. Does it make a difference to you whether the duck hunting regulations change from year to year?
a. ____ Yes b. ____ No

11. How does changing the duck hunting regulations from year to year affect your duck hunting **satisfaction**?
a. ____ Increases satisfaction b. ____ No effect c. ____ Decreases satisfaction

12. Overall, would simplifying the regulations **affect your decision to hunt** ducks?
a. ____ Yes b. ____ No

13. How would simplifying the regulations affect your hunting **satisfaction**?
a. ____ Increases satisfaction b. ____ No effect c. ____ Decreases satisfaction

14. Have you ever **not** hunted ducks for an entire season because the duck hunting regulations were too hard to understand?
a. ____ Yes b. ____ No c. ____ Don't know

15. Overall, which one of the following most affects your decision to hunt ducks each season (check one)?

a. ____ Bag size
b. ____ Season length
c. ____ Abundance of ducks
d. ____ Special regulations
e. ____ None of the above

Part F. Questions 1-3 below list descriptions of 3 general types of satisfactions that a person could seek from duck hunting. Please read each description carefully, then circle the number that indicates **how important** those particular kinds of satisfactions are to you **as a motivation to hunt ducks**.

	Not Important				Extremely important
1. Satisfaction Group 1 Getting a bag limit or almost always being successful in bagging ducks, making a difficult shot, showing ducks bagged to family or friends, being thought of as a good duck hunter, or having good duck hunting equipment.	0	1	2	3	4
2. Satisfaction Group 2 Sharing stories of duck hunting activities with companions, maintaining traditions of duck hunting with others, or simply being afield with other people you like.	0	1	2	3	4
3. Satisfaction Group 3 Simply getting away from everyday problems, experiencing the solitude, smells, and sounds of the outdoors through duck hunting, and observing all types of waterfowl.	0	1	2	3	4

THANK YOU VERY MUCH FOR YOUR PARTICIPATION. PLEASE RETURN THE SURVEY AS INSTRUCTED IN THE COVER LETTER.

Appendix B: Survey Data Collected From Alberta Hunters

Question A1: Year of birth (n = 484)

Birth Year	Frequency	Percent	Birth Year	Frequency	Percent	Birth Year	Frequency	Percent
1918	2	0.4	1941	6	1.2	1962	10	2.1
1919	1	0.2	1942	11	2.3	1963	9	1.9
1921	2	0.4	1943	10	2.1	1964	4	0.8
1922	3	0.6	1944	12	2.5	1965	16	3.3
1923	2	0.4	1945	10	2.1	1966	12	2.5
1924	3	0.6	1946	8	1.7	1967	6	1.2
1925	2	0.4	1947	13	2.7	1968	10	2.1
1927	5	1.0	1948	11	2.3	1969	9	1.9
1928	6	1.2	1949	13	2.7	1970	13	2.7
1929	6	1.2	1950	15	3.1	1971	4	0.8
1930	6	1.2	1951	17	3.5	1972	4	0.8
1931	4	0.8	1952	10	2.1	1973	5	1.0
1932	9	1.9	1953	14	2.9	1974	3	0.6
1933	9	1.9	1954	14	2.9	1975	2	0.4
1934	6	1.2	1955	9	1.9	1976	3	0.6
1935	6	1.2	1956	16	3.3	1977	3	0.6
1936	6	1.2	1957	12	2.5	1978	1	0.2
1937	10	2.1	1958	10	2.1	1979	3	0.6
1938	9	1.9	1959	13	2.7	1980	1	0.2
1939	10	2.1	1960	12	2.5			
1940	7	1.4	1961	16	3.3			

Question A2: Gender (n = 509)

Sex	Frequency	Percent
Male	504	99.0
Female	5	1.0

Question A3: Province or state hunted (n = 509)

Jurisdiction hunted	Frequency	Percent
Alberta	509	100.0

Question A4: Number of years hunted (n = 503)

Years	Frequency	Percent	Years	Frequency	Percent
1	14	2.8	29	5	1.0
2	14	2.8	30	46	9.1
3	9	1.8	31	3	0.6
4	9	1.8	32	6	1.2
5	14	2.8	33	5	1.0
6	12	2.4	34	5	1.0
7	7	1.4	35	18	3.6
8	8	1.63	36	3	0.6
9	2	0.4	37	4	0.8
10	35	7.0	38	2	0.4
11	9	1.8	39	4	0.8
12	14	2.8	40	36	7.2
13	6	1.2	42	6	1.2
14	6	1.2	43	2	0.4
15	18	3.6	44	3	0.6
16	8	1.6	45	17	3.4
17	8	1.6	46	4	0.8
18	9	1.8	47	1	0.2
19	3	0.6	50	17	3.4
20	28	5.6	51	1	0.2
21	5	1.0	52	3	0.6
22	4	0.8	53	1	0.2
23	7	1.4	54	1	0.2
24	3	0.6	55	5	1.0
25	30	6.0	56	2	0.4
26	9	1.8	60	5	1.0
27	2	0.4	65	1	0.2
28	4	0.8			

Question A5: Number of days hunted waterfowl (n = 504)

Number Days	Frequency	Percent	Number Days	Frequency	Percent
0	12	2.4	17	2	0.4
1	29	5.8	18	3	0.6
2	39	7.7	19	1	0.2
3	54	10.7	20	28	5.6
4	53	10.5	21	5	1.0
5	42	8.3	24	1	0.2
6	31	6.2	25	5	1.0
7	23	4.6	30	9	1.8
8	23	4.6	32	1	0.2
9	3	0.6	35	2	0.4
10	82	16.3	40	4	0.8
12	10	2.0	45	1	0.2
14	9	1.8	52	1	0.2
15	27	5.4	75	1	0.2
16	3	0.6			

Question A6: Number of ducks bagged last season (n = 509)

Number of ducks	Frequency	Percent
Did not hunt ducks	31	6.1
No ducks bagged	40	7.9
Bagged 1 - 10	228	44.8
Bagged more than 10	210	41.3

Question A7: Number of hunters that hunted with a youth (n = 503)

	Frequency	Percent
Did hunt with youth	85	16.9
Did not hunt with youth	418	83.1

Question A8: Number of youth hunters in family (n = 470)

Number of youths	Frequency	Percent
0	16	41.0
1	16	41.0
2	6	15.4
3	1	2.6

Question A9: Participation history (n = 506)

	Frequency	Percent
Hunted each of last 4 seasons	311	61.5
Hunted some but not all of last 4 seasons	179	35.4
Last year was first year hunting	15	3.0
Plan to hunt for first time next year	1	0.2

Question A10: Expected days of hunting next year (n = 507)

	Frequency	Percent
None	12	2.4
Less than 7 times	229	45.2
More than 7 times	266	52.5

Question B1: Participation with a bag limit of 1 duck/day (n = 430)

Participation level	Frequency	Percent
Would hunt no days (0)	258	60.0
Would hunt fewer days (1)	65	15.1
Would hunt same days (2)	83	19.3
Would hunt more days (3)	24	5.6

Question B2: Participation with a bag limit of 2 ducks/day (n = 429)

Participation level	Frequency	Percent
Would hunt no days (0)	220	51.3
Would hunt fewer days (1)	86	20.0
Would hunt same days (2)	100	23.3
Would hunt more days (3)	23	5.4

Question B3: Participation with a bag limit of 3 ducks/day (n = 428)

Participation level	Frequency	Percent
Would hunt no days (0)	148	34.6
Would hunt fewer days (1)	121	28.3
Would hunt same days (2)	140	32.7
Would hunt more days (3)	19	4.4

Question B4: Participation with a bag limit of 4 ducks/day (n = 428)

Participation level	Frequency	Percent
Would hunt no days (0)	67	15.7
Would hunt fewer days (1)	100	23.4
Would hunt same days (2)	245	57.2
Would hunt more days (3)	16	3.7

Question B5: Participation with a bag limit of 5 ducks/day (n = 442)

Participation level	Frequency	Percent
Would hunt no days (0)	12	2.7
Would hunt fewer days (1)	42	9.5
Would hunt same days (2)	347	78.5
Would hunt more days (3)	41	9.3

Question B6: Participation with a bag limit of 6 ducks/day (n = 438)

Participation level	Frequency	Percent
Would hunt no days (0)	8	1.8
Would hunt fewer days (1)	36	8.2
Would hunt same days (2)	350	79.9
Would hunt more days (3)	44	10.0

Question B7: Participation with a bag limit of 7 ducks/day (n = 428)

Participation level	Frequency	Percent
Would hunt no days (0)	5	1.2
Would hunt fewer days (1)	52	12.1
Would hunt same days (2)	320	74.8
Would hunt more days (3)	51	11.9

Question B8: Participation with a bag limit of 8 ducks/day (n = 431)

Participation level	Frequency	Percent
Would hunt no days (0)	9	2.1
Would hunt fewer days (1)	60	13.9
Would hunt same days (2)	296	68.7
Would hunt more days (3)	66	15.3

Question B9: Participation with a bag limit of 9 ducks/day (n = 423)

Participation level	Frequency	Percent
Would hunt no days (0)	10	2.4
Would hunt fewer days (1)	73	17.3
Would hunt same days (2)	261	61.7
Would hunt more days (3)	79	18.7

Question B10: Participation with a bag limit of 10 ducks/day (n = 427)

Participation level	Frequency	Percent
Would hunt no days (0)	10	2.3
Would hunt fewer days (1)	77	18.0
Would hunt same days (2)	257	60.2
Would hunt more days (3)	83	19.4

Question B11: Increased bag or longer season for increased opportunity (n = 502)

Preferred action	Frequency	Percent
Bag increased with same season	206	41.0
Longer season with same bag	203	40.4
Do not care	93	18.5

Question B12: Increased bag or longer season for same opportunity (n = 505)

Preferred action	Frequency	Percent
Bag increased with shorter season	83	16.4
Longer season with smaller bag	123	24.4
Same season and bag as last year	299	59.2

Question B13: Decreased bag or shorter season for decreased opportunity (n = 505)

Preferred action	Frequency	Percent
Bag decreased with same season	288	57.0
Shorter season with same bag	172	34.1
Do not care	45	8.9

Question B14: Not hunted because of small bag limit (n = 509)

	Frequency	Percent
Yes	48	9.4
No	434	85.3
Do not remember	27	5.3

Question B15: Bag limit as large as possible, or maximum bag limit size (n = 505)

Preference	Frequency	Percent
Bag limit as large as possible	191	37.8
Maximum bag limit size	314	62.2

Question B16: Maximum bag limit should be: (n = 290)

Preferred maximum bag limit size	Frequency	Percent
2	3	1.0
3	1	0.3
4	15	5.2
5	51	17.6
6	46	15.9
7	17	5.9
8	70	24.1
9	2	0.7
10	68	23.4
11	1	0.3
12	7	2.4
15	6	2.1
17	1	0.3
20	1	0.3
25	1	0.3

Question C1: Participation with a season length of one week (n = 437)

Participation level	Frequency	Percent
Would hunt no days (0)	198	45.3
Would hunt fewer days (1)	116	26.5
Would hunt same days (2)	70	16.0
Would hunt more days (3)	53	12.1

Question C2: Participation with a season length of three weeks (n = 435)

Participation level	Frequency	Percent
Would hunt no days (0)	136	31.3
Would hunt fewer days (1)	143	32.9
Would hunt same days (2)	100	23.0
Would hunt more days (3)	56	12.9

Question C3: Participation with a season length of five weeks (n = 436)

Participation level	Frequency	Percent
Would hunt no days (0)	66	15.1
Would hunt fewer days (1)	133	30.5
Would hunt same days (2)	177	40.6
Would hunt more days (3)	60	13.8

Question C4: Participation with a season length of seven weeks (n = 432)

Participation level	Frequency	Percent
Would hunt no days (0)	24	5.6
Would hunt fewer days (1)	71	16.4
Would hunt same days (2)	286	66.2
Would hunt more days (3)	51	11.8

Question C5: Participation with a season length of nine weeks (n = 438)

Participation level	Frequency	Percent
Would hunt no days (0)	9	2.1
Would hunt fewer days (1)	40	9.1
Would hunt same days (2)	338	77.2
Would hunt more days (3)	51	11.6

Question C6: Participation with a season length of eleven weeks (n = 428)

Participation level	Frequency	Percent
Would hunt no days (0)	8	1.9
Would hunt fewer days (1)	24	5.6
Would hunt same days (2)	319	74.4
Would hunt more days (3)	77	17.9

Question C7: Participation with a season length of thirteen weeks (n = 416)

Participation level	Frequency	Percent
Would hunt no days (0)	7	1.7
Would hunt fewer days (1)	23	5.5
Would hunt same days (2)	285	68.5
Would hunt more days (3)	101	24.3

Question C8: Participation with a season length of fifteen weeks (n = 419)

Participation level	Frequency	Percent
Would hunt no days (0)	7	1.7
Would hunt fewer days (1)	22	5.3
Would hunt same days (2)	280	66.8
Would hunt more days (3)	110	26.3

Question C9: Not hunted because of short season length (n = 507)

	Frequency	Percent
Yes	21	4.1
No	460	90.7
Do not remember	26	5.1

Question D1: Sources of knowledge about abundance of ducks (n = 507)

Source	Frequency	Percent
Wildlife agency reports	81	16.0
Sporting group reports	70	13.8
Magazine/newspaper articles	14	2.8
Number of ducks seen	198	39.1
Reports do not affect decision to hunt	115	22.7
None of the above	29	5.7

Question D2: Participation if duck abundance half of what it was last year (n = 456)

Participation level	Frequency	Percent
Would hunt no days (0)	100	21.9
Would hunt fewer days (1)	210	46.1
Would hunt the same days (2)	140	30.7
Would hunt more days (3)	6	1.3

Question D3: Participation if duck abundance somewhat less than last year (n = 462)

Participation level	Frequency	Percent
Would hunt no days (0)	24	5.2
Would hunt fewer days (1)	177	38.3
Would hunt the same days (2)	256	55.4
Would hunt more days (3)	5	1.1

Question D4: Participation if duck abundance the same as last year (n = 469)

Participation level	Frequency	Percent
Would hunt no days (0)	7	1.5
Would hunt fewer days (1)	10	2.1
Would hunt the same days (2)	422	90.0
Would hunt more days (3)	30	6.4

Question D5: Participation if duck abundance somewhat more than last year (n = 466)

Participation level	Frequency	Percent
Would hunt no days (0)	3	0.6
Would hunt fewer days (1)	7	1.5
Would hunt the same days (2)	344	73.8
Would hunt more days (3)	112	24.0

Question D6: Participation if duck abundance twice that of last year (n = 459)

Participation level	Frequency	Percent
Would hunt no days (0)	1	0.2
Would hunt fewer days (1)	6	1.3
Would hunt the same days (2)	222	48.4
Would hunt more days (3)	230	50.1

Question D7: Not hunted because duck population was too low (n = 505)

	Frequency	Percent
Yes	131	25.9
No	338	66.9
Do not remember	36	7.1

Question E1: Is hunting affected by species/sex restrictions (n = 505)

	Frequency	Percent
Yes	108	21.4
No	397	78.6

Question E2: How do species/sex restrictions affect hunting satisfaction (n = 506)

	Frequency	Percent
Increased satisfaction	70	13.8
No effect	324	64.0
Decreased satisfaction	112	22.1

Question E3: Accept smaller bag limit to have fewer species/sex restrictions (n = 506)

	Frequency	Percent
Yes	219	43.3
No	189	37.4
Do not know	98	19.4

Question E4: Do zones make regulations hard to understand (n = 506)

	Frequency	Percent
Yes	117	23.1
No	358	70.8
Not applicable	31	6.1

Question E5: How do zones affect hunting satisfaction (n = 501)

	Frequency	Percent
Increased satisfaction	8	1.6
No effect	427	85.2
Decreased satisfaction	66	13.2

Question E6: Do split seasons make regulations hard to understand (n = 370)

	Frequency	Percent
Yes	105	28.4
No	178	48.1
Not applicable	87	23.5

Question E7: How do split seasons affect hunting satisfaction (n = 343)

	Frequency	Percent
Increased satisfaction	8	2.3
No effect	228	66.5
Decreased satisfaction	107	31.2

Question E8: Does weekend opening of season matter (n = 502)

	Frequency	Percent
Yes	107	21.3
No	395	78.7

Question E9: How do weekend opening affect hunting satisfaction (n = 504)

	Frequency	Percent
Increased satisfaction	88	17.5
No effect	368	73.0
Decreased satisfaction	48	9.5

Question E10: Do annual regulation changes matter (n = 502)

	Frequency	Percent
Yes	191	38.0
No	311	62.0

Question E11: How do annual regulation changes affect hunting satisfaction (n = 501)

	Frequency	Percent
Increased satisfaction	33	6.6
No effect	330	65.9
Decreased satisfaction	138	27.5

Question E12: Would simpler regulations affect decision to hunt (n = 505)

	Frequency	Percent
Yes	114	22.6
No	391	77.4

Question E13: How would simpler regulations affect hunting satisfaction (n = 504)

	Frequency	Percent
Increased satisfaction	189	37.5
No effect	310	61.5
Decreased satisfaction	5	1.0

Question E14: Not hunted because regulations too hard to understand (n = 505)

	Frequency	Percent
Yes	5	1.0
No	493	97.6
Do not know	7	1.4

Question E15: Factors affecting decision to hunt (n = 505)

Potential factors	Frequency	Percent
Bag size	37	7.3
Season length	55	10.9
Abundance of ducks	246	48.7
Special regulations	4	0.8
None of the above	163	32.3

Question F1: Importance of achievement factors as motivation for hunting (n = 505)

	Frequency	Percent
No importance (0)	119	24.5
Some importance (1)	98	20.2
Important (2)	140	28.8
Very important (3)	87	17.9
Extremely important (4)	42	8.6

Question F2: Importance of affiliation factors as motivation for hunting (n = 489)

	Frequency	Percent
No importance (0)	17	3.5
Some importance (1)	24	4.9
Important (2)	74	15.1
Very important (3)	157	32.1
Extremely important (4)	217	44.4

Question F3: Importance of appreciation factors as motivation for hunting (n = 493)

	Frequency	Percent
No importance (0)	2	0.4
Some importance (1)	3	0.6
Important (2)	23	4.7
Very important (3)	93	18.9
Extremely important (4)	372	75.5

Appendix C: Summarized Data From Alberta and the Four Flyways

Question	Alberta	Atlantic Flyway	Mississ. Flyway	Central Flyway	Pacific Flyway
A1-Year of birth	1951±15.54	1955	1955	1955	1954
A2-Gender (% males)	99.0	98.7	98.7	98.0	97.6
A4-No. years hunted ducks	24.11±14.97	18.2	19.7	20.7	20.5
A5-Days hunted ducks	8.72±8.20	11.2	15.6	10.8	11.6
A6-Ducks bagged last season					
--did not hunt (%)	6.1	7.9	5.8	13.4	9.2
--bagged none (%)	7.9	8.9	7.2	9.1	8.9
--bagged 1-10 (%)	44.8	40.6	37.0	40.1	35.5
--bagged >10 (%)	41.3	42.6	50.0	37.4	46.4
A7-Hunt with youth (% yes)	16.9	23.1	23.9	27.2	20.3
A8 No. Youths in family	0.79	1.06	0.92	0.91	0.66
A9-Hunting history					
--each of last 4 (%)	61.5	68	69	55	60
--some of last 4 (%)	35.4	28	26	41	34
--last year 1st year (%)	3.0	4	4	3	6
--next year 1st year (%)	0.2	<1	<1	<1	<1
A10-Days hunting next year					
--none (%)	2.4	1.2	1.0	2.5	2.1
--less than 7 times (%)	45.2	27.6	20.2	35.4	30.0
--more than 7 times (%)	52.5	71.2	78.8	62.0	67.9
B-Participation with bag limit of					
1- 1 duck/day (mean)	0.70±0.96	1.14	1.26	1.12	0.92
2- 2 ducks/day (mean)	0.83±0.97	1.41	1.50	1.35	1.10
3- 3 ducks/day (mean)	1.07±0.92	1.89	1.94	1.79	1.53
4- 4 ducks/day (mean)	1.49±0.80	2.10	2.15	2.08	1.94
5- 5 ducks/day (mean)	1.94±0.54	2.19	2.24	2.23	2.13
6- 6 ducks/day (mean)	1.98±0.51	2.23	2.27	2.27	2.21
7- 7 ducks/day (mean)	1.97±0.54	2.23	2.30	2.31	2.26
8- 8 ducks/day (mean)	1.97±0.61	2.23	2.30	2.33	2.28
9- 9 ducks/day (mean)	1.97±0.67	2.23	2.30	2.33	2.28
10-10 ducks/day (mean)	1.97±0.68	2.23	2.30	2.33	2.28
B11-Increased opportunity preferences					
--bag size increased (%)	41.0	19.1	20.4	24.1	18.8
--season length increased (%)	40.4	75.8	73.8	65.0	73.3
--no opinion (%)	18.5	5.1	5.8	10.9	7.9

Question	Alberta	Atlantic Flyway	Mississ. Flyway	Central Flyway	Pacific Flyway
B12-Same opportunity preferences					
--bag size increased (%)	16.4	11.6	10.3	13.8	10.5
--season length increased (%)	24.4	46.5	46.3	40.2	46.3
--same bag and season as last (%)	59.2	42.0	43.4	46.1	43.2
B13-Decreased opportunity preferences					
--bag size decrease (%)	57.0	70.6	71.6	62.1	69.1
--season length decrease (%)	34.1	22.9	23.7	28.1	24.7
--no opinion (%)	8.9	6.6	4.7	9.8	6.2
B14-Not hunted because bag limit too small (% Yes)	9.4	12.9	12.8	16.2	10.5
B15-Maximum or fixed bag limit					
--bag as large as possible (%)	37.8	41.5	47.7	49.9	43.7
--maximum bag size (5)	62.2	58.5	52.3	50.1	56.3
B16-Mean size of maximum bag	7.67±2.76	5.27	5.16	5.51	6.33
C Participation with season length					
1- of 1 week (mean)	0.95±1.05	1.43	1.43	1.29	1.10
2- of 3 weeks (mean)	1.17±1.01	1.72	1.66	1.54	1.29
3- of 5 weeks (mean)	1.53±0.91	2.09	2.04	1.91	1.61
4- of 7 weeks (mean)	1.84±0.69	2.33	2.31	2.17	1.88
5- of 9 weeks (mean)	1.98±0.54	2.50	2.50	2.36	2.13
6- of 11 weeks (mean)	2.10±0.58	2.63	2.62	2.54	2.36
7- of 13 weeks (mean)	2.15±0.59	2.68	2.67	2.63	2.55
8- of 15 weeks (mean)	2.18±0.59	2.68	2.68	2.65	2.61
D1-Information sources on abundance of ducks					
- state and federal agencies (%)	16.0	11.9	15.8	16.4	14.0
- sporting groups (%)	13.8	8.6	7.7	6.7	10.0
- magazines/newspapers (%)	2.8	2.0	3.8	5.3	6.0
- ducks seen (%)	39.1	39.2	26.2	35.5	29.0
- abundance of no affect (%)	22.7	31.4	38.0	29.7	33.1
- none of the above (%)	5.7	6.9	8.5	6.4	8.0
D2-Participation if ½ number of ducks (mean)	1.11±0.75	1.49	1.58	1.43	1.42
D3-Participation if somewhat fewer ducks (mean)	1.52±0.61	1.78	1.87	1.77	1.78
D4-Participation if same number of ducks (mean)	2.01±0.38	2.08	2.14	2.12	2.11
D5-Participation if somewhat more ducks (mean)	2.21±0.49	2.37	2.41	2.39	2.37

Question	Alberta	Atlantic Flyway	Mississ. Flyway	Central Flyway	Pacific Flyway
D6-Participation if twice as many ducks (mean)	2.48±0.54	2.64	2.63	2.66	2.67
D7-Not hunted because report of ducks too low (% Yes)	25.9	12.7	15.0	23.4	17.2
E1-Species/sex restrictions affect hunting decision (% Yes)	21.4	12.6	7.6	13.8	13.3
E2-Effect of species/sex restrictions on hunting satisfaction					
--increases satisfaction (%)	13.8	10.5	14.7	14.9	13.0
--no effect (%)	64.0	64.5	69.7	65.3	59.8
--decreases satisfaction (%)	22.1	25.5	15.6	19.8	27.2
E3-Accept smaller bag for fewer species/sex restrictions					
--Yes (%)	43.3	32.0	26.8	30.0	30.0
-- No (%)	37.4	45.5	46.9	43.6	49.3
E4-Zones make regulations hard to understand					
--Yes (%)	23.1	35.5	31.8	39.9	41.8
--No(%)	70.8	54.6	62.6	55.6	53.3
E5-Effect of zones on hunting satisfaction					
--increases satisfaction (%)	23.1	5.9	7.4	4.8	4.5
--no effect (%)	70.8	73.0	74.5	69.9	68.6
--decreases satisfaction (%)	6.1	21.1	18.1	25.3	26.8
E6-Split seasons made regulations hard to understand (% Yes)	28.4	20.8	25.0	35.8	32.4
E7-Effect of split seasons on hunting satisfaction					
--increases satisfaction (%)	2.3	15.5	16.2	7.4	10.0
--no effect (%)	66.5	60.5	56.8	57.0	49.6
--decreases satisfaction (%)	31.2	23.9	27.1	35.6	40.4
E8-Do weekend openings matter					
--% Yes	21.3	41.9	45.3	44.2	37.2
E9-Effect of weekend opening on hunting satisfaction					
--increases satisfaction (%)	17.5	35.9	43.3	44.3	32.8
--no effect (%)	73.0	45.3	46.8	49.2	53.9
--decreases satisfaction (%)	9.5	18.8	9.9	6.5	13.3
E10-Are annual regulation changes important (% Yes)	38.0	46.1	42.4	43.0	45.7

Question	Alberta	Atlantic Flyway	Mississ. Flyway	Central Flyway	Pacific Flyway
E11-Effect of annual changes on hunting satisfaction					
--increases satisfaction (%)	6.6	4.9	6.9	5.6	5.9
--no effect (%)	65.9	60.0	64.7	62.5	59.8
--decreases satisfaction (%)	27.5	35.1	28.4	31.9	34.3
E12-Would reg. simplification affect decision to hunt (% Yes)	22.6	27.9	23.6	32.1	27.4
E13-Effect of simplification on hunting satisfaction					
--increases satisfaction (%)	37.5	47.7	42.8	48.3	46.2
--no effect (%)	61.5	51.3	56.5	50.6	52.5
--decreases satisfaction (%)	1.0	1.0	0.8	1.0	1.3
E14-Not hunted because regs. hard to understand (% Yes)	1.0	3.9	2.6	5.0	3.9
E15-What affects decision to hunt					
--bag size (%)	7.3	7.4	5.1	7.1	7.4
--season length (%)	10.9	20.6	18.6	15.6	19.6
--duck abundance (%)	48.7	32.7	33.6	40.1	24.1
--special regulations (%)	0.8	2.3	1.9	2.8	3.0
--none of the above (%)	32.3	37.1	40.8	34.4	35.9
F1-Importance of achievement factors (mean)	1.66±1.26	1.91	1.95	1.83	1.90
F2-Importance of affiliation factors (mean)	3.09±1.05	3.38	3.45	3.25	3.26
F3-Importance of appreciation factors (mean)	3.68±0.63	3.68	3.68	3.67	3.66

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